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CIRCLE OF THE MECHANIC ARTS.

No. VI.

From the New World.

SUGAR-REFINING.—NO. II.

[Fig. 2.]

We return, then, to the operations on the sugar which we had traced through the filtering-bags. All the liquor, as it leaves the filters, flows through pipes into other parts of the building occupied by charcoal-cisterns, each of which is a square vessel several feet in height, and provided with a double bottom, the upper one being perforated with small holes. On this perforated bottom a piece of cloth is laid, and on the cloth a layer of powdered animal charcoal, or "bone-black," nearly three feet in thickness. The saccharine liquor flows on the surface of this charcoal bed, through which it slowly finds its way, percolating to the bottom, then through the meshes of the cloth, and lastly, through the perforations into the vacant space beneath. The effects of this filtration is very striking; for the liquor, which, though transparent, is of a reddish color when it flows into these cisterns, leaves them in a state of colorless transparency almost equal to that of pure water. Such a complete decoloration is the best proof of the success of the modern improvements in this branch of manufacture. The cloth bags, and the arrangements by which the liquor is made to flow through them, remove all the opaque impurities; while the charcoal and the apparatus of which it forms a part, remove the coloring matters from the filtered liquor.

In the premises is situated a retort-house, supplied with furnaces, retorts, and various subsidiary arrangements. These, whose use might, to a stranger, appear rather inexplicable in a sugar-refinery, exemplify one of the most curious and valuable properties in the charcoal employed. When the process of decoloring the sugar has rendered the charcoal impure, water is poured through the mass in the cistern, until all the soluble part of the saccharine impurities is removed; after which the charcoal is removed from the square cisterns, carried to the retort house, and put into iron retorts. The process is so conducted, that the charcoal leaves the retorts in a state as fit for use as when it was first made; all the impurities having been burned away, without any deteriorations in the decoloring qualities of the charcoal. Thus the same portions of charcoal may be used over and over again.

Every one knows that loaf-sugar, as well as moist, possesses different degrees of whiteness and clearness of appearance. The mode in which these different qualities arise we shall presently state; but we may here remark, that it is only the finest qualities which present the pure and colorless appearance alluded to above, after passing through the charcoal. The inferior kinds retain a slight tinge of color.

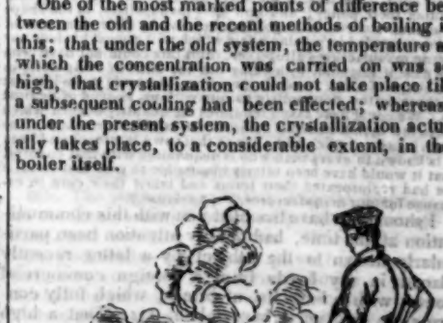
We next visited that part of the building in which the most important of all the operations is carried on, viz. the boiling. If we were to attempt a discription of all the inventions and contrivances which have been brought to bear on this process, it would not only absorb all our remaining space, but would involve scientific details unsuited to our purpose: it must suffice to show how the method usually adopted at the present day differs from the old one, now almost absolete.

The liquor consists of sugar capable of assuming a crystalline form—molasses, or uncrystallizable sugar—and water; and the object of the boiling is to drive off a portion of the water in the form of steam, and to prepare the sugar for crystallizing. Under the old system, the saccharine liquor was poured into a large copper vessel called a "pan," and then boiled over an open fire, at a temperature gradually rising to 230° or 250°, until the evaporation had caused it to assume a degree of viscidity known by experience to be proper for the purpose. From the pan it was emptied into vessels called "coolers," where it was beaten violently with an oar or staff, by the action of which the sugar was so far disentangled from the molasses as to be able to granulate, or become partially crystallized. It was found, however, that independent of other evils, the sugar was liable in that process to be injured by the high temperature at which it boiled; for there is a tendency to decomposition, even at the temperature of boiling water; and at a still greater heat the tendency is increased. These circumstances led to the happy suggestion of a method of boiling the sugar in vacuo. In the common operations with which we are familiar, boiling water is always nearly of one temperature, because it is exposed to a tolerably uniform atmospheric pressure; but if this pressure could be removed by the action of the air-pump, or some other means, boiling would take place at a temperature so low that the hand could bear it with impunity So likewise in the case of sugar-liquor; if the pressure of the atmosphere could be removed, the process of boiling, which is nothing more than a very rapid evaporation, would take place at so low a temperature that the sugar would not be injured by it, viz. from 130° to 150, that is, one hundred degrees lower than under the atmospheric pressure. Nearly all the principal sugar-refiners now boil sugar in vacuo, more or less perfect; each one adopting a form of apparatus or a routine of processes best suited to the circumstances under which he conducts his business. We shall presently make a few further remarks on the introduction of this plan; but it will be desirable first to trace the sugar through the boiling process.

The process, then, is briefly this: The liquid sugar, after percolating through the charcoal, and being collected in a cistern several feet below the pans, is placed in communication with them by an ascending pipe; and the air being withdrawn from within each pan by means of an air-pump, the liquid sugar ascends the pipe into the vacuum by atmospheric pressure from without, on the same principle as the water ascends in a common pump. Steam is then admitted to a vacant space below the sugar in the pan, and also through pipes traversing the interior; and by these means the sugar is brought to a boiling state while comparatively at a low temperature, on account of the tolerably perfect vacuum existing above the surface of the liquor in the pan. As the evaporation proceeds, the vapor flows through a large iron pipe into an open court, where a cistern of cold water condenses it as fast as it is formed, and thus maintains a vacuum within the boiler. The sugar, by this evaporation thickens and becomes partially granulated; and to ascertain how far this process has extended, a most ingenious instrument called a "proof-rod," is used, by which a small quantity of sugar may be taken out without disturbing the vacuum in the pan. A hollow tube is fixed in the pan, with the outer end exposed to the atmosphere, but the inner end immersed in the liquid sugar; this inner end is constructed with a socket and plug, like the key of an ordinary liquor-cock, with two appertures through which, when open, liquor may flow. The proof-rod being introduced into the tube and turned round, unlocks the socket and plug in the tube, and allows the liquid sugar to flow through the apertures of the socket and plug into a recess at the bottom of the key. The proof-rod being again turned, locks up the apertures in the tube, and on being withdrawn, brings with it a small sample of liquid sugar. (See fig. 2.)

The attendant boiler then tests the state of the sugar, to ascertain what degree of tenacity and granulation it has acquired. If the result is not satisfactory, the boiling is continued for some time longer; but if satisfactory, a valve at the bottom of the pan is opened, and the sugar flows through a pipe into a room beneath, where vessels are placed for its reception. The sugar, as it flows through, appears to be much altered, for it is now a mass of crystals enveloped in a dark-colored syrup. The purpose to which the pans are applied is to drive off, in the form of vapor, so much of the water which has been mixed with the sugar as to enable the latter to crystallize.

One of the most marked points of difference between the old and the recent methods of boiling is this; that under the old system, the temperature at which the concentration was carried on was so high, that crystallization could not take place till a subsequent cooling had been effected; whereas, under the present system, the crystallization actually takes place, to a considerable extent, in the boiler itself.



After having witnessed the operations and apparatus connected with the boiling, we next followed the progress of the sugar to a room on the lower floor of the building, containing vessels called *heaters*, into which the sugar flows from the pans.

It is a curious circumstance, that under the old system, the corresponding vessels were termed *coolers*, as being at a much lower temperature than that at which the sugar was boiled in the pans; but they are now called by an opposite name, because the sugar is here raised to a temperature of about 180°, having previously been boiled at 135° or 140°. While being raised to this higher temperature, the sugar is kept constantly stirred.

From the Northern Light.

THE TARIFF QUESTION.

BY EDWARD C. DELAVAN.

(Continued.)

I also add extracts from a speech made by Mr. Cobden, member of parliament, at a great meeting held at Manchester in October. Mr. Cobden has frequently been in this country, and I understand from those who had the pleasure of making his acquaintance while here, that few gentlemen on this or the other side of the Atlantic better understands our position, and the necessity his government has laid upon us to protect ourselves against its ruinous prohibitory policy.

Mr. Cobden, M. P. being called upon remarked: "We have complaints against the Americans for having passed this tariff; and we find the monopolist newspapers railing against the American legislature on that account. Why, if they are sincere in their professions that it is well for us to depend upon ourselves for what we want, surely that doctrine applies to other countries as well as to our own; and they ought to hail its adoption in foreign nations, and be glad to see what the Americans are about. But they are reviling the Americans for carrying out their own principles. Why, let them fight our battles on transatlantic ground, if they choose; we will leave them in the slough of their inconsistency. But what has been the cause of this American tariff? We must not lose sight of the fact, that it is our own fault, and our own fault entirely, that we are shut out of the American market. We will go back to 1833. We know that at that period great excitement existed in the states on the subject of their tariff on our manufactured goods; the excitement was excessive, and in one state, the state of Carolina, which sends us our principal supply of cotton, the people rose almost into rebellion against the government on account of the high duties which were imposed on our manufactures. And we know the consequence was, that an act was passed in 1833, reducing the duties on the import of our manufactured goods into America, every year, for ten years, until at the end of ten years there should be no higher duty than 20 per cent on any of our manufactured commodities. That act expired at midsummer this year.

"Now, what has been done by our government? What has been done by this country to meet that liberal and that reciprocal policy which was offered to us by the United States? Why, if this had been going on in the moon, it would not have excited less attention with our successive governments, and, I am sorry to say, less attention with our people. We have been utterly regardless of the attempts of America to trade with us. Now, at the end of the ten years, the Americans look at the result of their policy; and they actually find that they are doing less business with us now, at the end of the ten years, than when they begun their reductions. Their cotton, tobacco, and rice have fallen in value; we still take nothing else; we have shut out their corn. The Americans have, therefore, no motive for continuing their policy; and now busy monopolists, in the shape of manufacturers, have got together and by their management have succeeded in passing a law which will almost exclude our cotton manufactures altogether. But this could not have been the case if England, by holding out the hand of reciprocity in the shape of a law to admit their corn, had made it the interest of those cotton monopolists to vote with us, instead of against us. We could have taken ten times the quantity of corn which these few manufacturing monopolists could have taken. The Americans are quick and alive to their own interests, and I say it is known to every man who is acquainted with that country, that it would have been utterly impossible to pass that tariff, if we had reciprocated their terms and taken their corn in exchange for our manufactures." [Applause.]

I should not have troubled you with this communication at this time, had not my attention been particularly drawn to the subject by a letter recently placed in my hands from a foreign commercial house, with a long list of prices, which fully confirms the position I have taken, viz: That a high rate of duties, not prohibitory, does not necessarily fall upon the consumer to the extent usually supposed.

In the list of articles, from which I have made extracts, not one is higher than during the time that the low tariff of 30th of April was in operation. Some articles yet remain the same, but in most cases there is a reduction in price, intended to meet the increase of duties, so as to make the loss fall on England rather than upon the consumer here. In fact, in the language of the European house, the object of this reduction is "to nullify," as far as the American consumer is concerned, the late act of congress increasing the duties. I conclude the reason why all the articles in the list, from which I have made extracts, are not subjected to a reduction in price to "nullify" the advance duty, is owing entirely to the consideration, that the foreign manufacturer is not yet satisfied that such reduction is necessary. The moment it is found that the skill and enterprise of our artisans are about to supply our market with these articles, (not yet reduced in price,) it will not be long, in my opinion, before the reduction will be made on these articles also; that in most cases, to secure our market—prices will be reduced to "nullify" the new tariff of duties—as far as the consumer is concerned, and to check as far as possible the efforts of our domestic artisans to supply our own wants.

In the list furnished by this European house, which you will find below, we give the prices and discounts for April 30, when the duties were 23 per cent, and of October 3, when they were at 30 per cent.

I also add two invoices, the one showing the cost to the consumer and revenue produced to the government, under the prices and duties of 30th of April; and the other those of October, with other statements, which will explain themselves. I will, however, add that in most cases the gross prices in England are established permanently; but as the market falls, the discount is increased; as it rises the discount falls, as will be perceived by the two invoices appended.

New-York, Oct. 26, 1842.

MESSRS. E. CORKING & Co., Albany:

Dear Sirs—The January prices of goods you will have had in the invoice we put up for you. We send you the prices of April, and quotations of October; the latter represents the prices goods were offered at, but with orders in hand, (which at that time we had not,) goods might probably be bought lower.

You will see that to a great extent, the difference between 23 per cent and 30 per cent duties would be nullified; but some other exclusive duties in the tariff, we say nothing about compensating for.

Should you think fit to entrust us with an order, we will do our best to make it answer your purpose.

Yours resp'y, ——— ———

PRICES OF SUNDRY HARDWARE, IN BIRMINGHAM.

Articles.	Prices, April 30th, 1842.	Prices, October 3d, 1842.
Bed Screws,	Square head, ⅜ Iron, 6 in., 4s. 3d. sterl.	Square head, ⅜ Iron, 6 in., 3s. 9d sterling.
Bells,	White metal tea, 60 p. c. disc.	White metal tea, 62½ p.c. disc.
Bellows,	Smith's & Small, 55 do.	Smith's & Small, 57½ do.
Brass Nails,	Common, 55 do.	Common, 57½ do.
Bolts,	Common round, 80 do.	Common round, 82½ do.
do.	Best Barrel, 67½ do.	Best Barrel, 70 do.
do.	London Tower, 67½ do.	London Tower, 70 do.
Bullet Moulds,	32 and upwards, 2s	32 and upwards, 1s. 10d.
Candlesticks,	Iron, 67½ p.c. disc.	Iron, 70 p. c. disc.
do.	Brass, chamber, fr. qual., 6 in., 10s. 6d	Brass, chamber, fair quality, 6 in., 10s.
do.	do. do. best strong, 14s	do. do. best strong, 13s. 6d.
Chains,	Bright trace, 6½ ft. No. 2, 10 lks., 1s. 3d	Bright trace, 6½ ft., No. 2, 10 lks, 1s. 3d.
do.	do. do. 12 lks., 1s. 5d.	do. do. 12 lks., 1s. 2d.
do.	do. No. 3, 10 lks., 1s. 1d	do. No. 3, 10 lks., 11d.
do.	do. do. 12 lks., 1s. 3d	do. do. 12 lks., 1s.1½d.
do.	Halter, 4½ ft. 18 link, 6, 5s. 9d	Halter, 4½ ft. 18 link, 6, 5s. 6d.
do.	Ox or Log, ⅝ in., 13s	Ox or Log, ⅝ in., 11s. 6d.
do.	Coil or Ship, ⅝ in, proved, 16s	Coil or Ship, ⅝ in., proved, 14s. 6d.
Chest Handles,	Common wrought, 80 p. c. disc.	Common wrought, 82½ p.c. disc.
do.	Best improved, 55 do.	Best improved, 57½ do.
Curtain Rings,	55 do.	57½ do.
Fire Irons,	Black'd rivd. pans, 72½ do.	75 do.
Frying Pans,	Short handle, 60 do.	Short handle, 62½ do.
do.	Long handle, 18s.	Long handle, 17s.
Hammers,	Shoe, black, No. 1, 6s. 57½ p.c. disc	Shoe, black, No. 1, 60 p. c. disc.
Hinges	Wrought, common, 65 do.	Wrought common, 67½ do.
do.	Hooks & Hinges, wired, 13s. 9d	Hooks & Hinges, wired, 12s. 6d.
do.	Pressed, common, 70 p. c. disc	Pressed, common, 72½ p.c. disc.
H llow Ware,	Cast, common makers, 52½ do.	Cast, common makers, 55 do.
do.	" best " 50 do.	" best " 52½ do.
Jack Chain,	Iron, 65 do.	Iron, 67½ do.
do.	Brass, 60 do.	Brass, 62½ do.
Latches,	Bright Thumb, 57½ do.	Bright Thumb, 60 do.
do.	Long, lacq'd furn., 6 in., 6s. 1d	Long, lacq'd furn., 6 in., 5s. 10d.
do.	Square, lacq'd furn., 4 in., 5s. 3d.	Square, lacq'd furn., 4 in., 5s. 2d.
do.	Square impr'd, l. f., bolted, 4 in., 7s. 9d.	Square, impr'd, l. f., bolted, 4 in., 7s. 6d.
Locks,	Banbury, Bastard plate, 62½ p.c. disc.	Banbury, Bastard plate, 65 p. c. disc.
do.	Cabinet, riv'd, pressed, 75 do.	Cabinet, riv'd, pressed, 77½ do.
do.	" " forged, 65 do.	" " forged, 67½ do.
do.	" screw'd " 65 do.	" screwed " 67½ do.
do.	Brass Cabinet, 60 do.	Brass Cabinet, 62½ do.
do.	Rim, 6 in., 2 bolt, s. s., best furn., 12s. 9d	Rim, 6 in., 2 bolt, s. s., best furn., 12s.
do.	" Tildsleys, 27s	" Tildsleys, 26s. 6d.
do.	" im., fr. q., 6 in., 2 bolts, best f., 25s.	" im., fr. q., 6 in., 2 bolts, best f. 23s.
do.	Mortice, 6 in., 2 bolt, s. s., best furn., 26s.	Mortice, 6 in., 2 bolt, s. s., best furn., 25s.
do.	Closet, 4 in., common, complete, 3s. 3d	Closet, 4 in., common, complete, 3s.
do.	" best, fine ward, full bushed and screwed, assorted fancies, double staple, 8 in., 23s.	" best, fine ward, full bushed and screwed, assorted fancies, double staple, 8 in., 19s. 6d.
do.	Pad, 2½ in., 1 wh, thick pin, b. d., 1s. 10d	Pad, 2½ in., 1 wh., thick pin, b. d., 1s. 8d.
do.	" 3 in., 2 wh., tumbler bush'd, assorted fancies, 5s.	" 3 in., 2 wh., tumbler bush'd, assorted fancies, 4s. 6d.
do.	" Brass, 1½ in., 1 wheel taper, 1s. 3d.	" Brass, 1½ in., 1 wh., taper, 1s. 1d.
do.	Till, 2½ in., plain, 3 key, 7½ a 9	Till, 2½ in. plain, 3 key, 6½ a 7d.
do.	Brass case, lacq'd, 6 in., 2 bolt, best furniture, s. s., 30s.	Brass case, lacq'd, 6 in., 2 bolt, best furniture, s. s., 29s. 6d.
Measuring Tapes,	65 p. c, disc.	65 p. c., and 5 off nett.
Nails,	All sorts, 40 do.	All sorts, 45 p. c. disc.
Rivets,	Black and Tinned, 37½ do.	Black and Tinned, 42½ do.
Sad Irons,	Good, £10 5s.	Good, £9 5s.
Stair Rods,	No. 1, turned ends, 70 p. c. disc.	No. 1, turned ends, 72½ p.c. disc.
Tenter Hooks,	Iron and Tinned, 37½ do.	Iron and Tinned, 42½ do.
Vices,	40 do.	45 do.
Weights,	Ring, 28 lbs., 2s.; 56 lbs., 4s.	Ring, 28 lbs., 1s. 11d.; 56 lbs., 3s. 1d.
Wire,	Brass, 0 a 20, 9½d.	Brass, 0 a 20, 9½d
do.	Copper, 0 a 20, 1s. 1d.	Copper, 0 a 20, 1s
Wood Screws,	"James," 50 p. c. disc.	"James," 52½ p.c. disc.

N. B. Many brass foundry and other patterns are lower in October.

BELLS.

Bells are made of a mixture of about three parts of copper to one of tin, and sometimes a proportion of silver, according to the shape and size the bell is to be. They are cast in moulds of sand—the melted metal being poured into them.

The parts of a bell are—its body, or barrel, the clapper, with inside, and the links which suspend it from the top of the bell.

The sound of a bell arises from the vibratory motion of its parts, like that of a musical string. The stroke of a clapper, drives the parts struck away from the centre, and the metal of the bell being elastic, they not only recover themselves, but even spring back a little nearer the centre than they were before struck by the clapper. Thus the circumference of the bell undergoes alternate changes of figure, and gives that tremulous motion to the air in which sound consists.

The sound which the metal thus gives, arises not so much from the metal itself, as from the form in which it is made. A lump of bell-metal gives little or no sound; but, cast into a bell, it is strikingly musical. A piece of lead, which is not at all a sonorous body, if moulded into proper shape, will give sound, which, therefore, arises from the form of the object.

The origin of bells is not known. Those of a small size are very ancient. Among the Jews it was ordered by Moses, that the lower part of the blue robe, which was worn by the high priest, should be adorned with pomegranates and gold bells, intermixed at equal distances.

Among Christians, bells were first employed to call together religious congregations, for which purpose runners had been employed before. Afterwards the people were called together by little pieces of board struck together, hence called sacred boards; and lastly by bells.

Paulinius, bishop of Nola, in Campania, is said to have first introduced church bells in the fourth century. In the sixth century they were used in convents, and were suspended on the roof of the church, in a frame. In the eighth century an absurd custom of baptizing and naming bells begun; after this they were supposed to clear the air from the influence of evil spirits.

Church bells were, probably, introduced into England soon after their invention. They are mentioned by Bede, about the close of the seventh century. In the East they came into use in the ninth century.

In former times, it was the custom for the people to build immense minsters, and to apply their wealth in ornamenting their places of worship. The same spirit made them vie with each other in the size of their bells. The great bell of Moscow, cast in 1653, in the reign of the Empress Anne, is computed to weigh 443,772 lbs.

Bells are of great service at sea during a very dark night, or thick fog; they are kept in such cases, constantly ringing. Near the Bell Rock light-house, in England, as a warning to the mariner in fogs or dark weather, two large bells, each weighing twelve hundred pounds are tolled day and night, by the same machinery which moves the lights, by which means, ships keep off these dangerous rocks.

RUSSEL'S PLANETARIUM.

This extraordinary piece of mechanism, which we noticed in Sept. last, as being then exhibited at Buffalo, has passed by us, and is now in New York. The following notice of it we find in the *Journal of Commerce.*

Through the politeness of Prof. Gourard, we have been favoured with an opportunity of seeing this wonderful piece of mechanism. The whole solar system, with the circle of the Zodiac, are represented in motion, with probably a pretty near approximation to their relative velocties. We were struck with the combination of different motions produced by the machinery, all being in regular harmony, and conducted without noise. Satellites were made to revolve around primaries, while the latter revolving on their axes, went in harmony around the sun. All these combinations of motion are produced with very little display of machinery. The grand central power which moves the whole, is not visible; but the harmonious movement of all the bodies is truly imposing, and we are confident that as a piece of machanism respecting the arrangements of the celestial bodies, it has never been surpassed. We understand that it will be kept in the city, this winter, and that it will be used to illustrate the motions of the celestial bodies in a course of lectures on Astronomy. The following from the Utica Baptist Register, contains a more complete account of this machine.

It is an immense piece of scientific mechanism, of cyclopean fabrication, all composed of highly polished steel or brass, and solid cast iron, all silvered and gilded, and the whole of which weighs no less than two tons. The *Zodiac Table* supporting the whole machinery is more than 16 feet in diameter; the orbit of Uranus embraces an area of 66 feet in circumferance; and the number of wheels and pinions regulating the complicated and multiple motions of the mechanism, amount to nearly six hundred. Indeed, some idea may be formed of the immensity, finish, and complication of this masterly piece of *American skill and genius*, when it is known that thousands of dollars, with thirty years of arduous labor and unabated perseverance, have been employed by its author, Mr. James Russel, of Columbus, (Ohio,) to bring it to perfection; and this perfection will be easily conceived, by the fact that the whole solar system, i. e. the remote planets, Uranus, with the six sattellites. Saturn, with his rings and seven attendants, Jupiter, with his four, Mars, Venus, Mercury, the Earth, with the moon and the lesser planets, the ecliptic, with numerous stars, and the sun in the centre, binding all together, revolving harmoniously in their respective orbits, and in *mathematical proportion of time* with regard to each other—that all this vast and astonishing combination is put in motion by the operation of a single crank, requiring hardly the application of one pound weight! and that the multiplicity thus executed by so many hundreds of wheels and pinions, do not produce even as much noise as the ticking of a miniature watch!

INCREASE OF INTENSITY OF SOUND DURING THE NIGHT.

To the question, so often put, as to the cause of the increase of the intensity of sound during the night time—a circumstance so remarkable as to have escaped the attention of no individual—we copy the following from the Edinburgh Encyclopedia.

"Every person must have observed, that sounds, such as that of falling water, &c., which are faintly or not at all heard during the day time, are distinctly audible at night, even when the direction and force of the wind and every other general circumstance is the same. This curious fact was remarked even by the ancients. In large cities, or in their neighborhood, the increase in the distinctness of sound has been ascribed to the cessation of the powers of animated beings, such as men, insects and birds, and also to the cessation of the action of winds upon the leaves of trees. When the celebarted traveler, Baron Humboldt, first heard the noise of the great cataracts of the Oronoco, in the plain which surrounds the mission of the Apures, his attention was particularly called to this curious fact; and he was of opinion that the noise was three times greater in the night than in the day. The usual explanation of the phenomenon was quite insufficient in this case, as the humming of insects was much greater in the night than in the day, and the breeze which might have agitated the leaves of the trees never rose till after sunset. Humboldt was therefore led to ascribe the diminution of sound during the day to the presence of the sun, which influences the propagation and intensity of sound, by opposing to them currents of air of different density, and partial undulations of the atmosphere produced by the heating of the different parts of the ground. In these cases, a wave of sound when it meets two portions of air of different density, is divided into two or more waves, a part of the primitive wave being propagated with more rapidity through the denser portions than the parts that pass through air of less density. In this way the wave is broken down into different parts, which arrive at the ear at different times. The different portions of the wave passing again through succeeding portions of the atmosphere of different density, may be so wasted and frittered down as to be incapable of affecting the tympanum."

This curious phenomenon is precisely analogous to the production of the mirage, or phenomenon of unequal refraction of light, which is caused by the mixture of portions of air of different refractive density. The above explanation will account also for the distinctness with which all sounds are heard in the calm that precedes the storm.

SIX ARGUMENTS AGAINST THE PRISON SYSTEM.

1st. The employment of convicts in mechanical branches of industry, places the state virtually in business competition with a numerous and worthy class of citizens, which is injurious to the latter, and therefore invidious and unjust.

2d. Mechanics do really support the state prisons to the extent that the mechanic arts carried on in them do nominally. It is an invidious and unjust tax upon one class of community, for mechanics to be thus burdened with the chief weight of their support. Public institutions like these should be sustained by the whole public. Every class of community ought to bear its proportionate share of the burden.

3d. The mechanical industry of respectable citizens, is by the present state prison system, made to compete with that of felons. This is a degradation which mechanics ought not and must not submit to.

4th. Mechanical ocupations are honourable and ought not to be otherwise reputed in any case. The employment of convicts in mechanical occupations as a part of the felony, does have a tendency to make these occupations be otherwise than honourably reputed. Therefore the practice of giving convicts such employment ought to be abolished.

5th. The felon acquires under this system, in his two or three years term of punishment, the same advantage that the honest unoffending citizen toils through a long apprenticeship of more than twice that number of years to gain, viz. a good trade. This is gross unjustice, and ought not to be tolerated. It is a premium paid to crime at the expense of integrity and virtue.

6th. The state prison system exposes respectable mechanics almost necessarily to unjust suspicions, and insulting questions. Where did you learn your trade—in the state prison? is the question every employer feels himself bound to put to mechanics asking employment, from the number of state prison graduates let loose upon the public. The necessity of such questions ought not to exist, and therefore the state prison system ought to be reformed. The reputable mechanic who has earned the advantage of his trade by a long and faithful service of apprenticeship, is also often compelled to associate with persons who have acquired the same trade as a punishment for infamous offences. This is an intolerable hardship, but a direct result of the system which ought therefore to be amended.—*Western Lit. Messenger.*

POWER OF INDUSTRY.—It was a beautiful expresion of a Chinese sage, that, by time and industry a mulbery leaf becomes a silk shawl. If the following statement be correct, it affords a still more striking proof what human ingenuity can accomplish. In the manufacture of steel, an article may be raised from one half penny to 35,000 guineas! A pound of crude iron costs one half penny; it is converted into steel, into watch springs, every one of which is sold for half a guinea, and weighs only the 10th of a grain; after deducting for waste, there are in a pound weight 7,000 grains. It affords steel for 70,000 watch springs, the value of which, at a half guinea each, is 30,000 guineas.

KNOWLEDGE FOR THE PEOPLE.

MECHANICS.

Why were the battering rams of the ancients such formidable engines of war?

Because they allowed the concentrated efforts of many hands, and a considerable duration of action, so as to give at last one great and sudden shock.

The action of gunpowder on bullets, although appearing so sudden, is still not an instantaneous, but a gradual, and therefore accelerating motion; and accordingly we find the effect to depend much on the length of the piece along which the force pursues the ball.—*Arnott.*

Why will a cannon or musket ball, shot quite horizontally, touch the ground of a level plane just as soon as another ball dropped at the same instant directly from the cannon's mouth?

Because the forward or projectile motion does not at all interfere with the action of gravity. This fact, observes Dr. Arnott, which most persons, before consideration, would be disposed to doubt, make strikingly sensible the extraordinary speed of a cannon ball; *viz.* which has already carried it 600 or 800 feet before touching, during the half second that a ball dropped from the hand of a standing person requires to reach the earth. The fact also explains why, for a long range, the gun must always be pointed more or less upwards. —*Elements of Physics*

The velocity of a musket ball is, on an average, 1,600 feet per second, and its range half a mile.

Why is this range only half a mile, whereas, by theory it ought to be ten miles?

Because it is retarded by the resistance of the air.

In velocities exceeding 1,600 feet per second, the resistance of the air is greatly increased; hence the absurdity of giving balls too great an initial velocity. To give a bullet the velocity of 2000 feet per second, requires half as much more powder as to give it the velocity of 1,600 feet; yet after both have moved 400 feet, the difference between the velocity of each is reduced to 8 feet per second. A 24-pound ball, moving at the rate of 2000 feet per second, meets a resistance of 800 pounds.

If a body could be projected upwards with the velocity of 36,700 feet in a second, it would never return; and as it receded from the earth, its weight or gravity would diminish. At present, the greatest velocity with which we can project a body, does not exceed 2000 feet per second. A bullet rising a mile above the surface of the earth, loses 1-2000th part of its weight.—*Notes of Science.*

Lieut. Helwig, of Prussia, has invented a process for measuring the time occupied by a ball or bullet in passing through a certain space; by making the ball liberate the works of a time-keeper at the moment when it quits the mouth of the piece, and in making it also stop the time-keeper at the moment when it strikes an obstacle. Thus, he finds that a light body, of the same calibre with the bullet, moves, at the commencement, with much greater velocity than the latter; equal charges being used.

Steam cannon has not yet been found to realize all the formidable expectations which it had raised; but Mr. Perkins has estimated the projectile force of steam to be ten times greater than that of gunpowder, in throwing a ball to a given distance.

While on the subject of fire-arms, we may mention that an ingenious Frenchman proposes to fix a small mirror, 0.47 of an inch in the side, near the mouth-piece, so that the person using it shall see the reflection of his own eye. In this way it is supposed that very exact aim may be taken; and the experiments made by various officers and sportsmen, are said to encourage the idea that this application may be useful.

Why will a bullet, fired against a door hinging freely on its hinges, perforate the same without agitating it?

Because the impression of the stroke is confined to one single spot, and sufficient time is not allowed for diffusing its action over the extent of the door. A pellet of clay, a bit of tallow, or even a small bag of water, discharged from a pistol, will produce the same effect.

Why is sea-sickness produced on shipboard?

Because man, strictly to maintain his perpendicularity, that is, to keep the center of gravity always over the support of his body, requires standards of comparison, which he obtains chiefly by the perpendicularity or known position of things about him, as on land; but on shipboard, where the lines of the masts, windows, furniture, &c. are constantly changing, his standards of comparison are soon lost or disturbed. Hence, also, the reason why persons unaccustomed to the motion of a ship, often find relief by keeping their eyes directed to the fixed shore, where it is visible, or by lying on their backs, and shutting they eyes; and, on the other hand, the ill effects of looking over the side of the vessel at the restless waves of the sea.

Sea-sickness, observes Dr. Arnott, also depends partly on the irregular pressure of the bowels among themselves, and against the containing parts, when their inertia, or downward pressure, varies with the rising and falling of the ship.

Why cannot sure aim be taken with a stone in a sling?

Because the point from which it should depart, cannot be accurately determined.

Why is the pendulum a time-keeper?

Because the times of the vibrations are very nearly equal, whether it be moving much or little; that is to say, whether the arc described by it be large or small.

A common clock is merely a pendulum, with wheel-work attached to it, to record the number of the vibrations; and with a weight or spring, having force enough to counteract the retarding effects of friction and the resistance of the air. The wheels show how many swings or beats of the pendulum have taken place, because at every beat, a tooth of the last wheel is allowed to pass. Now, if this wheel has sixty teeth, as is common, it will just turn round once for sixty beats of the pendulum, or seconds; and a hand fixed on its axis, projecting through the dial-plate, will be the second hand of the clock. The other wheels are so connected with this first, and the numbers of the teeth on them so proportioned, that one turnes sixty times slower than the first, to fit its axis to carry a minute hand; and another, by moving twelve times slower still, is fitted to carry an hour-hand—*Arnott.*

Why do clocks denote the progress of time?

Because they count the oscillations of a pendulum; and by that peculiar property of the pendulum, that one vibration commences exactly where the last terminates, no part of time is lost or gained in the juxtaposition (or putting together) of the units so counted, so that the precise fractional part of a day, can be ascertained, which each such unit measures.

The origin of the pendulum is traced to Galileo's observation of a hanging lamp in a church at Pisa continuing to vibrate long and with singular uniformity, after any accidental cause of disturbance. Hence he was led to investigate the laws of the phenomenon, and out of what, in some shape or other, had been before men's eyes from the beginning of the world, his powerful genius extracted the most important results.

The invention of pendulum clocks took place about the middle of the seventeenth century; and the honor of the discovery is disputed between Galileo and Huygens. Becher contends for Galileo, and states that one Trifler made the first pendulum clock at Florence, under the direction of Galileo Galilei, and that a model of it was sent to Holland. The Accademia del Cemento also expressly declared, that the application of the pendulum to the movement of a clock, was first proposed by Galileo, and put in practice by his son, Vincenzo Galileo, in 1649. Huygens, however, contests the priority, and made a pendulum clock before 1658; and he insists, that if ever Galileo had entertained such an idea, he never brought it to perfection. Beckmann says the first pendulum clock made in England, was constructed in the year 1662, by one Tromantil, a Dutchman; but Grignon affirms that the first pendulum clock was made in England, by Robert Harris, 1641, and erected in Inigo Jones's church af St. Paul, Covent garden.

MILITARY CARRIAGE OF NAPOLEON.

The military carriage of Napoleon is considered an ingenious piece of mechanism. There is nothing extraordinary in its external appearance, it much resembling a common English travelling chariot. The body of the carriage is painted blue, and ornamented by a handsome gold border. The under-carriage and wheels are painted in vermillion and are neatly finished off by a handsome border of gold and blue. The imperial arms superbly emblazoned on the panels of the doors. A lamp is attached at each corner of the carriage, and one behind, so situated as to throw a strong light into the interior. In front is a projection, beyond which, is the coachman's seat. This is so contrived in order that the coachman cannot look within, while at the same time, a distinct view of the horses and the surrounding country can be taken by those inside. Attached to this front window is a curtain of strong painted canvass, which when let down effectually excludes rain, snow and damp. One of the panels in the back part of the carriage is so contrived as to let down; through this opening articles can be put in, or removed, at pleasure and without disturbing the traveller. The panels of the carriage are bulletproof, and the doors are guarded by bolts and locks; the window blinds which are raised or lowered by means of springs, cannot when shut be opened from without.

The conveniences inside, are worthy an imperial equipage. The emperor could in a few moments convert his travelling coach into a kitchen, bedroom, dressing-room, eating-room or study.

The kitchen utensils were a tea-pot, sugar-basin, coffee pot, coffee cup and saucer, cream, ewer, slop-basin, wash hand stand, candlesticks, breakfast plates, &c., &c.; these articles were splendidly ornamented with the imperial arms and the initial N. Of some of these articles there were found two sets, one of gold, and one of silver. By the aid of a lamp, any thing could be heated in the carriage.

Beneath the coachman's seat, was a small box containing a handsome steel bedstead, which could be fitted up in one or more minutes. Mattrasses and other articles of bedding of a very superior quality, were arranged ready for use.

In a small mahogany box nearly one hundred articles were contained, most of them of solid gold, for the personal convenience of the emperor.

Windsor soap, Eau de Cologue, Eau de Cabande, salt-spirits and English court-plaster were among the articles of the toilet.

The liquor-case contains two bottles; in one is rum, in the other some fine old Malaga wine. The liquors were found in the bottles at the time the carriage was taken.

A writing desk is so contrived as to enable a person to write while the carriage is proceeding. In it are found paper, pens, ink, and a portfolio. Maps, telescope, &c., are arranged in small apartments for the purpose. A netbag attached to the ceiling of the carriage is for the purpose of carrying small travelling requisites.

This carriage has been exhibited in Bullock's museum, Picadilly, and the articles here mentioned were then to be seen with the carriage.

A BAD SPELL.—"Thomas spell weather," said a country pedagogue to a boy, with a tow shirt, at the foot of the class.

"W-i e-a-th, weath, i-e-r—weather."

"Well, Thomas, I guess that is little the longest *spell* of weather you ever encountered. You may sit down and rest uponi t."—

A MOTHER'S PRIDE.—A girl of fifteen who knows how to make a noise on the piano, who wears more on her head than she ever earned, and has a bale of cotton on her back! There's no denying that are.

A lady asked her physician whether snuff was injurious to the brain. "No," said he, "for no one who *has any brains* ever takes snuff." A severe *pinch.*

ALBANY, SATURDAY, DEC. 31, 1842.

☞ We copy from the *Northern Light* an article on the subject of the tariff, in continuation. It contains a table of English prices, which will be of interest to some. The article will undoubtedly call out some of the writers on the other side of the question in reply; in which case we shall publish that also.

THE ALBANY COUNTY MECHANICS' ASSOCIATION, at their last meeting, have laid out work which, when finished, will show that they can make themselves useful in other matters beside their trades. They have taken the incipient steps to furnish statistics on subjects useful to others beside themselves.

☞ They have also made arrangements for LECTURES, which will commence, probably, next week; full notice will be given of the when and the where.

THE NEW YEAR.

The New Year is a God-send to an editor. No anxiety for a proper "leader" on the last week of the old year—he has a subject, ready, at hand, only requiring to be filled out—"ay, there 's the rub!" Pity New Year does n't come once in six months, as it does on some of those envious little planets that have crowded themselves between us and the sun. Well, then, we have reached one more stopping place in the highway of Time, where we can pause awhile, take breath, look round us, and start fresh again on another stage of life's journey. But, in looking round upon our fellow travelers, who started with us a twelvemonth since, all buoyant with hope and life, we find that many, very many, have reached their last home before they were aware of its proximity. Some we have shook by the hand and bidden *farewell*, but many more have left us unperceived and unknown, except perhaps to that little circle, of which every heart that throbs is the centre, and round which cling the holiest ties of affection and love. How mournfully pleasing is the thought that nearly every wayfarer, however humble or lowly his condition, when he has left the "journeying crowd," to lay him in his unbroken slumber, has felt the warm tear of sympathy drop on his fast-chilling cheek, soothing the spirit in the hour of its trial, and cheering the faintly-throbbing heart of the departing in its last agony. We have seen the rich and the poor, the old and the young, the pure and the unclean, all leave us—some with patience and resignation, sustained by the hope of Promise and secure in the confidence of a glorious resurrection—others we have seen, overtaken by the stern conqueror, writhing under the torturing pangs of conscience, that pictured fearfully upon the death-clouds that darkened their failing vision, the long array of crime and wrong, of grinding exaction and legalized robbery, the terrible work of years—saw them grasping with the agony of despair on every frail hope of life, and finally sink, seared and sealed by the awful curse of God—vain mockery, into their marble tomb!

We have seen the blooming infant, whose eye was as clear as an angel's, and whose smile was as soft and as pure as the warm sunlight of autumn, sink calmly in its last sleep, like the fading light of a summer's eve, while its fond mother smiled, amid her tears, that her little one, too pure for the atmosphere of earth, had fled, a cherub, to the bosom of its God. We have seen the pale student, whose eye burned with the enthusiasm of intellect, and before whose mental vision high hopes of the future passed in bright array—ambitious hopes of usefulness and honor; we have seen him sink beneath the sceptre of the transforming monarch, to rise, purged from the grossness of humanity, in the likeness of his Maker, to a heritage of immortality. We have seen the bright and beautiful maiden, whose step was lightness, whose voice was music, and whose very presence seemed a blessing, turn pale and wither beneath the icy finger of death; we have followed the beautiful clay to its resting place in the church yard, and dropped a tear over departed promise and innocence.

We have seen, too, struggling forth from the miserable tenements of vice and poverty, the scanty train of mourners, following the cold remains of those in whose bosoms, perhaps, though obscure and unknown, amid crime and misery, and under a vesture of rags, once beat a heart warm with all the generous feelings and sympathies of our nature, noble as the noblest, pure as the purest, but doomed, alas, to commune with vice, and to sink at last into the cold grave, unwept, unhonored. We have seen the bloated and festering corpse of the inebriate hurried by—of him once the pride and hope of fond parents and friends, but who, in an evil hour, tampered with the tyrant that enslaved and killed him—we have seen the dead body of the drunkard hurried by, and thrust, a loathsome mass, beneath the bosom of the shuddering earth. His children are beggars in the street; his wife, proud triumph of woman's affection! followed the remains of her wretched husband to the grave—but where is she now? Oh what tales of suffering could the miserable huts and hovels of our city unfold!

Dark, dark, sad and dark are the records of the past year. The whole wide world bears melancholy witness, how great the degradation of humanity. The wail of the oppressed, the enslaved, the down trodden and broken hearted, mingling with the clang of arms and the thunder of cannon, has pierced the ear of Heaven, and the smoke from human sacrifices, on the altar of lust and pride and unholy ambition, has risen hot and reeking to heaven, invoking vengeance from the high tribunal of Eternal Justice. The pauper thronged shores of once merrie England, the brutalized serfs of Russia, and the pining slave upon our own shores, all tell of man's misery and wretchedness.

Let the memory of these things chasten the overflowing anticipations of the future—let the wrongs and sufferings of the down trodden be remembered, and when the joyous circle gathers round the hospitable hearth, on the festival of the New Year, let not these be forgotten. Refuse not the boon to the mendicant, seek in the huts of the poor for subjects of thy bounty, and carry joy to the bedside of the sick and despondent. Never was there a time more appropriate to obey the divine injunction, "Remember the widow and the fatherless, comfort the poor and broken hearted," then shalt thou receive the approval, most to be desired, of thy own conscience, and be the blessed means of diffusing happiness and joy in places where they seldom come.

Reader, we have been led imperceptibly into this train of thought, and we commend what we have written to thy earnest attention. We have only room to add—to thee, thy wife, and thy children, (if perchance thou art blessed with them,) one and all, a HAPPY NEW YEAR, and may we long live to exchange greetings on this festive day.

STATE PRISON LABOR.

Next week commences the session of our state legislature. The expected report, from Ransom Cook, Esq., the commissioner appointed by the governor to inquire into the practicability of employing the convicts in the mining districts of our state, we trust will be presented early in the session, so as to call the attention of the legislature to the matter immediately. We have been informed, on good authority, that the report will be favorable to the object contemplated, but the mechanics should be awake to the evil, and send in their petitions immediately, unless the report is forthcoming. This winter must not be allowed to pass without some decisive and decided action upon this long vexed question, and we call upon our friends, one and all, throughout the state, to cooperate with us, and with a "long and strong pull, and a pull altogether," we can throw off this unjust burthen, and relieve ourselves from the injury and disgrace of the present odicus system. Let there be no relaxation on our part, but rather let disappointment and delay nerve us for a more determined and unyielding resistance. Success, notwithstanding all discouragements, must finally crown our efforts. Mechanics, be up and doing.

We shall keep our readers informed of every movement of our legislature in relation to this subject.

PRECEPT *vs.* PRACTICE—THE PORTLAND TRIBUNE.

The *vs.* that stands between the two words at the head of this article seems intended expressly for that place; at least it is most usually to be found there when the truth is told. The minister in his pulpit denounces the indulgence of all ill temper, and warns his hearers against it—this is his precept. Straightway he goeth home and chideth the wife of his bosom—there, then, is the practice with the *vs.* before it. An editor lecfureth a contemporary on the wrongfulness and impropriety of "purloining his articles" and publishing them without credit—and lo, in the same paper, like our worthy cousin of the Portland Tribune, we see him practicing the self same sin, yea, even under the most aggravated circumstances. This said cousin takes friend "Goodrich of the Waterfall," him of the "Woonsocket Sentinel" and the "Olive Branch" to task for publishing certain articles from his paper without credit; and yet, in the same sheet, if we recollect rightly, we find paraded conspicuously under (in big type) "For the Portland Tribune," *two* articles which we have seen in print before—one of them years ago. Now, either Mr. John Neal, of Portland,

Maine, imposes upon Mr. D. C. Colesworthy, of the same place, editor of the Tribune, or else the latter gentleman imposes upon the public in presenting to them as *original*, and written *expressly* for that paper, articles which were published many years since. Perhaps he thinks, and rightly too, that there are very few persons who would recognize, such is its fame, a certain poem(?) entitled the *Battle of Niagara*, by *Jehu O'Cataract*, Esq., when cut up in small doses, and headed with some taking title, as "Peace and War," "Our Country," &c., &c., *all* from the pen of John Neal. We certainly approve of the considerate spirit which prompted the administering of this poem in small quantities, to be taken weekly, on an empty stomach, (for fear of consequences,) and feel bound to thank him for not giving the whole frothy production to his readers and the public *at once*. Undoubtedly such a dose would effectually "*use up*" even the readers of the Tribune, who by this time must be pretty well hardened to it, for John has had at least, on an average, three articles per week for the last twelve month. "The *Battle of Niagara*," Neal's epic—heroic—gods, what shall we call it! never made much stir in the world—the best thing possible for the Jehu that drove his pen with such rapidity through its stanzas. Yet, in the glitter, tinsel, froth and rubbish, jumbled so confusedly together, occasional gems, like the following, are discovered, but they are indeed few and far between. Speaking of Niagara, the poet apostrophises—

Home of the waters! where their strength
Rolls in immeasurable length:
Or, tumbling from their cloudy thrones,
As thundering from a battlement,
With martial hymning, like the tones
Of battle shout, by warriors sent—
Go rioting in foam and spray,
With rainbow streamers o'er their way,
Beneath the precipice they've rent;
Exulting—as they burst their cloud—
As high—as dazzling—and as loud—
As sheets of light! in their descent
Thro' midnight's parting firmament!

Nothing we have ever met can surpass this. It is equal in many respects to Byron's description of a storm among the Alps, and is worthy of any poet that ever lived.

But to the Tribune. Besides these galvanized poems of Neal, we find a series of articles, or rather, extracts—written for the Tribune, of course, by Chas. Holden—and which we had the pleasure of reading some time ago, in a pamphlet, purporting to be an address delivered before the state convention of mechanics, by the above named gentleman. Now we do not object to the Tribune's publishing any thing which the editor may suppose will instruct or amuse his readers; indeed, in republishing Mr. Holden's address, we approve of his taste, but we must protest against his holding out wrong impressions, or sailing under false colors, more especially as he has rated some of his neighbors so roundly, for the less crime of publishing some of his articles without credit, a thing that will frequently happen, and unintentionally too.

The general character and tone of the Tribune we like very much; it is, indeed, one of the *best* papers on our exchange, and we make the above remarks in no unkind spirit, far from it; but for our part we must condemn the course pursued by the Tribune in this single matter. We trust our coz. will take the reproof with due humility, and "improve his ways" without delay, as we shall much dislike the necessity of "taking up labor" with him again. You may now take your seat.

ENGLISH RAIL ROADS.

We extract the following "Statistics of Mortality" from the London correspondence of the Journal of commerce. We know not how it would compare with a corresponding "report" in relation to the rail roads in our own country, but we suspect that the latter would show a fearful loss of life—trebly greater in proportion to the number of passengers. We have no means at hand, however, of ascertaining how great the loss of life has been, but it is probably larger than any one among us anticipates. Too much carelessness is manifested among us in regard to human life.

The report of the government officer to the Board of Trade on rail roads in this country, is now before me, from which it appears that in the year 1841 the accidents were 29, out of which number 24 persons were killed and 72 injured. These casualties occurred beyond the control of passengers, but in the same period the number of individuals who have suffered on railways, from their own negligence or misconduct, was 36—17 of whom died, and 20 were injured. Two "jumped off" after hats—12 "jumped off" because they wanted to stop, and 6 were "run over, crossing before a train." Several were killed by lying asleep on the rails, and others by falling from trucks on which they had perched whilst purloining a ride. In the same time 60 servants of companies suffered—28 being killed and 36 injured. The number of persons who traveled by railway in that year, from January 1st to July 1st, was 8,900,916—and the gross amount of their paid fares reached to £1,145,546 15*s.* 4*d.*

Twenty-four passengers only were killed, by circumstances beyond their control, out of 8,900,916—*one* to every 541,742! Would our American rail roads show no greater proportion? Would not the proportion be nearer 24 to every 541,742? We fear it would. As we remarked last week, we repeat, the public must take the correction of these matters in their own hands, for the voice of public opinion is, here, more potent than legislative enactments.

THE LITERARY AGE.

We acknowledge the receipt of the first two numbers of a well printed weekly, with the above rather novel title, published by G. W. Ridgeway, Philadelphia, at $3 per annum, and edited by Reynell Coates, M. D. A hurried glance through the pages of the two numbers before us has impressed us favorably with the character and design of the publication, and we doubt not but that it will prove a valuable accession to our periodical literature. We are not prepared to say, however, what reception it will meet from the public, for, to our shame be it spoken, the support of a chaste and well conducted periodical is seldom commensurate, indeed, in rather an inverse ratio to its merits. There are exceptions, nevertheless, and we hope that this new enterprise will prove one amongst them. The editor and publisher have our warmest wishes for their success, and we have only to add that in future we hope to have less profession on their part in relation to their new undertaking—let it rather speak for itself, and make its way in the world on its own merits.

AGENTS.—In addition to the agents whose names are published on the outside, the following gentlemen have kindly volunteered to act as such:

E. G. Chapin, Little Falls. E. T. Hayden, Syracuse.
D. B. Prince, Rome. R. Stone, Newark, Wayne Co.
C. A. Spence, , Canastota.

INTELLIGENCE.

The finished rail roads of the United States amount to 4442 miles, and their cost to at least one hundred millions of dollars! Besides this vast amount of iron *highways* there is a great amount of the same kind of work in progress.

John Uncas, the last male of the royal line of the celebrated chief of that name, died at Mohegan, Ct. on the 19th inst. at the advanced age of 89 yeras.

When Prof. Longfellow was in London last summer, he entered a church, and the first performance by the choir was the singing of his "Psalm of Life."

Another sculptor has sprung up in Cincinnati, Ohio in the person of Mr. Thompson. D. Jones has recently finished a bust of a citizen of that place, which is highly spoken of, as an admirable likeness, and a splendid work of art.

Dr. Jackson's geological survey of that state has resulted in the discovery of various mines of New Hampshire copper and iron. "One of the copper mines in Coos county," our correspondent says, "is destined soon to be a great source of wealth to the enterprising people of that section of the state. The mine is inexhaustible, yielding 33 per cent, pure copper of a superior quality, which, with the expense of one cent the pound, transportation, can be brought to Boston in any quantity.

M. J. Alexander, convicted of the manslaughter of Lougee at Philadelphia, was sentenced to undergo solitary imprisonment at hard labor, in the Eastern penitentiary; for the term of four years.

Gentlemen, a hard winter is upon us. Provisions are cheap, but sixpence worth grog costs sixpence yet. Remember that a sixpence a day saved, is nearly half enough to pay for your food. Economy and total abstinence, will carry you through the winter without debt, but moderate drinking and prodigality won't beg'n to.—*Buffalo American.*

The good people of Cincinnati, Ohio, were to indulge themselves with the luxury of gas light, for the first time, on Wednesday last.

There was remaining, on the 24th inst. at Sing Sing prison, 739 males and 67 females. Total, 806.

A German journal gives the following account of what it designates as one of those wonders in which electrical chemistry is so fertile:

A pupil of Berzelius, who was occupying himself in Sweden with galvanic gilding, having used in his apparatus the skin of a sheep, on which there was some of the wool remaining, perceived that it became partially covered with the gold. Struck with the incident, he followed up the idea it suggested, and in time produced an entire golden fleece, preserving the wool in its original and natural state as to texture and flexibility. Living in a village, the young *savant* showed the wonderful production to his neighbors, but fanatical and ignorant peasants, regarding him as a practiser of the black arts, attacked his laboratory, broke all his utensils to pieces and compelled him to fly with his fleece to Upsal, where he was received with kindness and consideration by the members of the University, who by a subscription not only supplied him with the means of subsistence, but established a new laboratory for him, and aided him in applying his new discovery to the manufacture of woollen cloth. We may therefore expect to have shortly, cloths of gold, silver and platina, which will entirely supersede our present gold lace and embroidery.

The new mill which is in progress of building in this city by the Lowell corporation, is intended for the introduction of new carpet power looms, which is a new invention by a young gentleman of this city. Heretofore; the hand loom alone has been used. By this new invention, one female will be able to do the work of three men. A few of these looms have been in operation for several months, and their complete success placed beyond a doubt.—*Lowell Courier.*

The steamboat Bellona went ashore at Kamarouska, near Quebec, on the 31 inst. The crew were unable to get ashore for some time by reason of the ice. The steward and one of the men perished during the night from cold, and the rest were after taken off, though badly frost-bitten.

The first railroad iron made in this country was made last January by the great western iron company, Pennsylvania, on the Allegany river, about 50 miles above Pittsburgh. This company is got up by New York and Boston capital. About 100 tons of rail road iron from these works, lately arrived at Pittsburgh, on its way for the rail road at Madison, Indianna. We are glad to see a commencement in manufacture here of this important article, for which millions of dollars have been sent abroad to purchase it in other countries.—*N. Y. Jour. of Commerce.*

The iron steamer, Valley Forge is sunk at the Grave Yard, in the Mississippi. She struck a log which stripped off 20 feet of her bottom, so that she sunk immediately. She was bound from New Orleans to St. Louis and was laden down to the guards with Turk's Island salt, which will be, of course, a total loss, and prove a serious disappointment to the pork packers, and others, who are in great want of, and waiting for the article.—She was the first iron steamboat on the western rivers, and was built at Pittsburgh in 1839, by way of experiment, at an expense of $60,000, and was 230 tons burthen. She was owned at Pittsburgh.

We were regaled, a few days since, with a feast of water melloa—fresh and luscious. It was plucked from the vine *eighty-three* days before it was presented to us, in Smyrna, and brought in a ship to Boston. —*Portland Argus.*

The large brick building, on the corner of S. Lansing street and the dock, occupied by Messrs. Howard & Ryckman as a brewery, was entirely destroyed by fire on Sunday night last. The fire was discovered about 11 o'clock, when the whole interior of the building was in flames. It was undoubtedly the work of an incendiary, as the building has been unoccupied for nearly two years. We regret to learn that Mr. Hawe, an industrious and hard working mechanic lost about 900 empty barrels which were stored in the cellar. The loss in the destruction of the building will be about $10,000—Insured for $3.000. The mayor has offered a reward of four hundred dollars for the incendiary.

The ship canal in Canada which connects the St. Lawrence with the upper lakes is completed. A large steamboat arrived at Kingston from Cornwall on the 30th ult.

The termination of the war in China is commemorated amongst the fashionable fair of the country by wearing small tea trays in lieu of broaches.

It is said the fattest hogs are raised in Cincinnati, Ohio—the fattest girls in Lowell, Mass. The hogs are worth at least three cents a pound *undressed*; but some of the girls are not worth two—*dressed.—Sunday Mercury.*

A curious thing occured in Philadelphia. A young woman actually pawned "a baby," and got two dollars on this "pledge" of love. The infant was so enveloped that the pawnbroker took it for a roll of linen He applied afterwards with the child to the guardians of the poor, but they refused to have anything to do with it until the six months are up for which it is pledged.

It is said, that the present mayor of London, forty years ago, was in the city of Nashville, Tenn., a journeyman plasterer.

It is stated in Leibig's Chemistry, that the disease called painter's colic, is unknown to all manufacturers of white lead in which the workmen are accustomed to take as a preventive, sulphuric acid, lemonade, or a solution of sugar rencered acid by sulphuric acid.

The distress of debtors in Ohio may be understood from the facts which are stated in a Dayton paper, "that well-saved hay has been sold at *a dollar a ton*, at a constable's sale, and excellent cows for *three dollars apecie*. At another constable's sale *five hundred* bushels of corn in the ear were sold for *three dollars!* and *eighty* acres of *wheat* well put in for the *same sum!*"

Baron Lederer, the Austrian consul general in New York, has offered for sale his magnificent collection of North American minerals.

BUSINESS NOTICES.

☞ All letters and communications intended for this paper should be *post paid to secure attention.*

Terms for vol. 2.—To clubs of 20 or more, having the paper sent in one package, $1 each per annum in advance.

To clubs of not less than 5, sent as above, $1.25 each, in advance.

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BINDING.—Subscribers wanting their volumes bound, can have them done in any style and at reasonable prices, by leaving them at this office.

Wood Engraving and Designing.

E. FORBES is prepared to attend to all business of the above description at the *Sculpture Rooms* 17 Stanwix Hall.

BOOK BINDING.—HARVEY H. CORNING, sign of the golden ledger, 82 State street, Albany, carries on the above business in all its various branches, viz: PLAIN, EXTRA and SUPER EXTRA—has a first rate RULING MACHINE and other necessary implements for manufacturing BLANK BOOKS of every description, on the most reasonable terms, of the best materials and workmanship.

N. B. An assortment kept on hand. 27.

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58 State street, Albany.

File-Cutting.

JOHN RUSSELL, No. 10 Beaver street, manufactures to order Files of every kind. Also, old Files recut in the best manner and on short notice. He offers the following testimonials from those who have used his Files.

Albany, 26th Sept., 1842.—To whom it may concern Having (for the last sixteen months) used constantly and indeed almost exclusively, John Russell's *Saw Files*, it gives me great pleasure to recommend the same to all users and dealers.

To consumers I need say no more, as they can see, try and judge for themselves But to merchants I would more particularly recommend them, as there is to my certain knowledge so many spurious article in market which are entirely useless except for sale and that only once. T. W. I. GROVES,

From the well known house of Richard Groves & Sons, Sheffield, Eng.

Albany, Aug. 2d, 1841.—This may certify that I have been in the practice of using John Russell's Recut Files, and am persuaded from the use of them, that they cannot be surpassed in no country, as far as my knowledge extends. S. TOPPING.

Albany, March 22d, 1841.—This is to certify that I have used the Files that have been recut and tempered by Mr. John Russell of this city, and can with confidence say that they have done as much service, and were in every respect as good as the same Files when new. ALBERT DWELLE, *Machinist.*

Albany, Nov. 11th, 1840.—I do hereby certify that I have used Mr. John Russell's Files in my shop for the last eight months, and have found them equal if not superior to any imported File I ever used. J. D. W. WEMPLE.

Albany, Aug. 2d, 1841.—This is to certify that we have used Files cut by Mr. John Russell, and have found them to be superior, both as to cutting and lasting, to any imported files that we have used for some years past.

JOHN S. PARRY, *Planemaker.*
CHS. CALVERLEY, *Saw Filer.*

Schenectady, Sept. 12th, 1842.—We hereby certify that Mr John Russell of Albany, has re-cut 24 dozen taper files for us, and we consider them worth 50 per cent. more than any new files we can buy. Mr. Russel can cut and temper files so as to adapt them to any particular use, and in that alone his files have a decided advantage We have used almost every stamp of English files, and we give Mr. Russell's files a decided preference over any kind we have used. F. H. HAMILTON & Co.,

Manufacturers of Wood Screws, Springville Works.

FIRE ENGINES!!

THE subscribers are manufacturing at Waterford, on an extensive scale, Fire Engines of various patterns, to suit purchasers, and they do not hesitate to recommend their Engines as decidedly superior to any now in use.

They manufacture the common Piston Engine, to work with chains or connecting rods, which they have improved in the construction of the brakes and the application of the power, so as to give them a decided advantage over those now in use. They also manufacture Rogers' Patent Balance Fire Engine, which has always been proved to be of *superior* power to all others.

Prices at the Factory, in complete order for use:

Those designed

For 40 men, largest Philadelphia size or 11 inch chambers,						$850
" 28 "	"	Albany	"	8 1-4	"	700
" 22 "	"	Common	"	7	"	600
" 16 "	"	N. York city	"	6 1-2	"	550
" 12 "	"	Small		5 1-2	"	450

These prices are one hundred dollars below what engines have formerly been sold for, but they are reduced to suit the times.

The above prices can be reduced $50, by dispensing with the tower and goose neck and passing the water through the forward end of the machine. The *utility* of such an engine is fully equal to any other form, but its appearance is not quite so good. They also manufacture Factory Engines and Forcing Pumps of all sizes; Suction and Leading Hose to order, both riveted and sewed, of the best quality.

They have been in the business 8 years, and might furnish many testimonials of good workmanship, &c., but as purchasers are supposed to prefer judging for themselves, the subscribers will furnish an engine where desired, and if on trial it is not fully equal in *all* respects to the *best* engines now in use, they will take it away without charge. Having an unlimited water power situated at the head of sloop navigation on the Hudson river, and near the junction of the Champlain and Erie canal, with a rail road connecting east with Boston and west with Buffalo, our facilities and arrangements for manufacturing are such that orders can be filled at any season of the year, and with the greatest promptness and despatch at the lowest rates.

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Will continue the above business at his old stand, and having made arrangements with manufacturers of Leather and Morocco in the cities of NEW-YORK, PHILADELPHIA, and ALBANY, and having in his employ first rate workmen, he is enabled to supply his customers with all the articles in his line on the most reasonable terms, at *Wholesale* or *Retail*, the following are included in his assortment: Oak and Hemlock Harness, Bridle, Collar, Horse, Trunk, Valise and Skirting Leather; Hog Skins, Philadelphia Russet Bridle, do. Facing Skins, do. Lining Hides, do. Top Hides, Patent Leather, Couch Reans, Neats Foot and Liver Oil, Carrier's Tools, Oak Sole Leather, Hemlock do., Wax and Grain Upper Leather, do. Calf Skins, Keen's Philadelphia do., Seal and Kip Skins, Splits and Weak Leather, Cordovan, Red, Green, White and Yellow Linings, Goat and Sheep Binding Skins, White Alum Dressed Linings, Dressed and Undressed Morocco, Colored Goat and Sheep Skins, English Shoe Thread of all numbers, India Rubber and Patent Cloth, Apron Skins, Stock Binding, &c.

N. B. An assortment of SHOE MAKER'S FINDINGS will be kept on hand.

Also, *Roller Skins, Engine Hose, Band, Picker, Strap, and Patent Leather*, on hand and made to order. *Albany*, 1841.

MISCELLANY.

EXCELSIOR.

BY H. W. LONGFELLOW.

The shades of night were falling fast,
As through an Alpine village passed
A youth, who bore, 'mid snow and ice,
A banner with the strange device,
Excelsior!

His brow was sad: his eye beneath,
Flashed like a falchion from its sheath,
And like a silver clarion rung
The accents of that unknown tongue,
Excelsior!

In happy homes he saw the light
Of household fires gleam warm and bright.
Above, the spectral glaciers shone,
And from his lips escaped a groan,
Excelsior!

"Try not the pass!" the old man said;
"Dark lowers the tempest overhead,
The roaring torrent is deep and wide!"
And loud that clarion voice replied,
Excelsior!

"Oh stay," the maiden said, "and rest
Thy weary head upon this breast!"
A tear stood in his soft blue eye,
But still he answered with a sigh,
Excelsior!

"Beware the pine tree's withered branch!
Beware the awful avalanche!"
This was the peasant's last good night,
A voice replied far up the height,
Excelsior!

At break of day as heavenward
The pious monks of saint Bernard
Uttered the oft repeated prayer,
A voice cried through the startled air
Excelsior!

A traveller, by the faithful hound,
Half buried in the snow was found,
Still grasping in his hand of ice
The banner with the strange device
Excelsior!

There in the twilight cold and gray,
Lifeless, but beautiful, he lay,
And from the sky, serene and far,
A voice fell, like a falling star!
Excelsior!

"THE RIBBON COST MORE THAN THE DRESS."—This remark was made in our hearing not long since in reference to a recent purchase of an ornamental ribbon and a comfortable calico dress. This brings to mind the fact that most of the pecuniary evils under which the people labor, have been brought upon them by the system of having "the Ribbon cost more than the Dress." All cases where sacrifices are made for the purpose of keeping up appearances in the community when the necessary income has fallen off, are of this character. And there are more sacrifices made for show, and for unnecesery articles of furniture and dress, than for necessary articles of comfort. Indeed, comfort itself is often sacrificed for show. So too, with those who skulk from honest labor, under the idea that it is not respectable to toil as other men; they will almost beg for employment which comports with their notions of respectibility, and nearly starve rather than engage in any other. Their ribbon cost them more than their dress.

The young man who commences business with high hopes and wishes to assume the responsibilities of manhood, and to enjoy the comforts of men of age and capital, instead of closely pursuing the details of business and acquiring the reputation and reaping the fruits of being a prudent, persevering and economical business man, finds at length that "the ribbon cost more than the dress."

The young woman who neglects acquiring a good education, in the pursuit after accomplishments—whose head is scarcely put to any other use but that of a milliner's block—who violates the laws of health for the reputation of possessing a small waist by tight lacing, and absorbs consumption from the damp earth and cold snow, in showing a neat thin shoe upon her feet—or who sings and trips about in gay and frivolous amusements or luxurious idleness, instead of seeking acquaintance with domestic affairs, is apt to find at length to her sorrow and shame, that "the ribbon cost more than the dress."

The politician, elevated by the people to posts of honour and trust, and who seeks his own selfish ends rather than the public good—who flatters the people by false promises, rather than serve them with honest purposes, and disposed to appropriate the power placed in his hands for the public good, to advance his own interests, is apt to discover in the end the truth of the remark, that "the ribbon cost more than the dress."

A multitude of other cases might be referred to, illustrating the fact that "the ribbon cost more than the dress," but these will be sufficient to direct the thoughts of our readers to examine for themselves and ascertain whether in any of their conduct they are paying more for the ribbon than for the dress."—*Bangor Courier.*

CHANGEABLE FLOWER.—On the island of Loochoo, says McLeod, is found a remarkable production, about the size of a cheery tree, bearing flowers, which alternately, on the same day, assume the tint of the rose or lily, as they are exposed to the sunshine or the shade. The bark of this tree is a dark green, and the flowers bear a resemblance to our common roses. Some of our party, whose powers of vision were strong, (assisted by vigorous imagination,) fancied that, by attentive watching, the changes of hue from white to red, under the sun's rays, was actually perceptible to the eye: that, however, they altered their color in the course of a few hours was very obvious.

PORCELAIN TABLE.—The celebrated porcelain table, called "La Table des Marechaux," presented by the emperor Napoleon to the city of Paris in 1810, is about to be disposed of by public lottery. This splendid and unique specimen of the art of painting on China, was, by order of the emperor, executed by Isabey, the most celebrated miniature painter of the age, and is admitted by all to be his best performance. It cost the emperor, it is stated, upwards of 12,000*l*.

SCULPTURED CHIMNEY.—In describing a magnificent *cheminee* of sculptured oak, in one of the apartments of the Palais de Justice, at Bruges, its romantic origin is thus related:

About the middle of the sixteenth century, a sculptor, named Andre, had acquired great and deserved reputation by his carvings in wood, and his success excited the jealousy of a rival to such a degree, that he determined, at all hazards, to effect his ruin. Entering the house of Andre in his absence, he vented his rage upon his aged mother, who was accidentally killed by his violence; and he contrived to fix the deed upon her son. Andre was condemned to death; but the evidence being far from satisfactory, a year of respite was granted, in the hope that he might find the means to establish his innocence, and on condition that he would employ the time upon some work of art to adorn the Palais de Justice. The year came round; the work was completed; and the magistrates proceeded to the prison-house with the reversal of the artist's condemnation; but—Andre was dead.

NEW ORLEANS PRISON.—In the report of the grand jury of N. Orleans, charged with the investigation of abuses in the 2d Municipality Workhouse we find the following:

"In a dungeon, admitting of no air whatever, was found a prisoner who was there detained in consequence of in attempt to murder one of the keepers. In this dungeon is constructed a certain machine, into which it is customary for the keepers to place and lock up such of the prisoners who in their opinion deserve punishment. There the prisoner is placed, with both his feet in two stationary iron rings, his neck in an iron collar, formed by two iron bars firmly fixed to the wall, whilst his arms are stretched, so that he cannot move in any way. Besides, a load of weight is placed upon his head. The grand Jury cannot refrain from noticing this strange mode of discipline, adopted in this prison, and calling the attention of the proper authority."

In the same report, the grand jury present the case of whipping white females as a barbarous mode of treatment.

PATENT AGENCY AND MECHANICAL ENGINEERING, *Office on F street, between 7th and 8th streets, opposite the Patent Office, Washington City, D. C.*—The subscriber has resigned his situation in the patent office (where he for some time superintended the restoration of patents destroyed by fire in 1836) to devote himself to the preparation of specifications and drawings, and all matters connected with the obtaining of patents for useful inventions either in this country or Europe. His experience in theoretical and practical mechanics, together with an intimate knowledge of the progress of the useful arts and manufactures, at home and abroad, will enable him to judge of the novelty and utility of inventions submitted to his examination; and as patents are not granted, under the existing patent laws, when the alleged inventions are wanting in novelty, or contravene the established laws of science, he will be able to furnish all the information necessary to avoid the expense of making application for patents which could not be granted.

Having established a foreign correspondence, he will be able to secure patents in Great Britain, France, and other parts of the continent, or furnish information, and prepare all the necessary papers for that purpose.

A model for a machine or apparatus, or specimens for a composition of matter, are required by law, before a patent can issue; by sending a model or specimens to the subscriber, with a short statement of the object of the invention, the necessary papers and drawings will be prepared and forwarded to the applicant for execution, thereby obviating the expenses consequent upon a journey to Washington, or delay in issuing the patent.

Being well acquainted with the patent laws of the United States, England and France, and the decisions of the courts in patent cases, he tenders his services where information is required in reference to infringements of patents, or defence against suits for infringement, such as compiling and arranging evidence, &c.

To individuals and companies wishing to procure drawings and estimates of machinery, or buildings, for manufactories, on the most modern and improved plans, or any other matter connected with mechanical engineering, he will furnish information; and, should it be required, will locate and superintend structures of this description.

Wishing to be generally useful to mechanics and inventors, he will attend to the sale of machinery and patent rights; thus, being a place of resort from all parts of the Union, is perhaps the best location for such a purpose.

Papers relating to patents can be sent to the commissioner of patents, when voluminous, free of postage, and models sent to the collectors of the principal ports, will also come free of expense, and the subscriber can be advised thereof by letter, which in all cases must be post paid. All applications for information relating to patents must be accompanied by a fee of five dollars; charges for other business transactions will be made according to their magnitude. J. JAMES GREENOUGH.

Certificate of Hon. H. L. ELLSWORTH, *Commissioner of Patents.*

PATENT OFFICE, NOV. 20th, 1842.

Mr. *J. J. Greenough*, who has for some years been employed in the patent office, in a highly responsible situation, under the act of 1836, restoring the records, having to my regret tendered his resignation, I take great pleasure in recommending him as a gentleman worthy of confidence, and as being particularly qualified to take charge of any business requiring a knowledge of mechanical science, the progress of the arts, and patent improvements. Mr. Greenough is also well acquainted with the practice of this office. HENRY L. ELLSWORTH.

REFERENCES.—Hon. S *Prentiss*, of *Vt.*, U. S. Senate; Hon. J. P. Kennedy, of *Md.*, U. S. House of Rep.; Hon. John C. Clark, of *N. Y.*, U. S. House of Rep.; Hon. W. Cranch, *Chief Justice, D. C.*; J. W. Hand, Esq., *Chief Clerk, Patent Office;* C. M. Keeler, Esq., *Examiner, Patent Office.*

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